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(6) XC-142A

VTOL TRANSPORT PROGRAM.

~~CONTRACT NO.~~ (5) AF33(657)-7868 ✓

(1) MONTHLY PROGRESS REPORT. no. 50 for Feb 66.

FOR

FEBRUARY 1966

LTV VOUGHT AERONAUTICS DIVISION 212 445

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W. J. Hesse
Vice President-Program Director
V/STOL Programs

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INTRODUCTION

This report has been prepared in accordance with the requirements of Item 7 of the Contract Number AF33(657)-7868 and is the fiftieth in a series of monthly reports covering activity on the XC-142A VTOL Transport Aircraft Program.

This report is devoted specifically to a summary of progress for the month of February 1966.

SUMMARY

The overall XC-142A program remained on schedule during the month of February toward the objective of delivery of aircraft No. 1 in May and No. 5 in April, 1966. The No. 1 aircraft remained in layup status throughout the month for transmission system inspection, with return to flight status expected by mid-March.

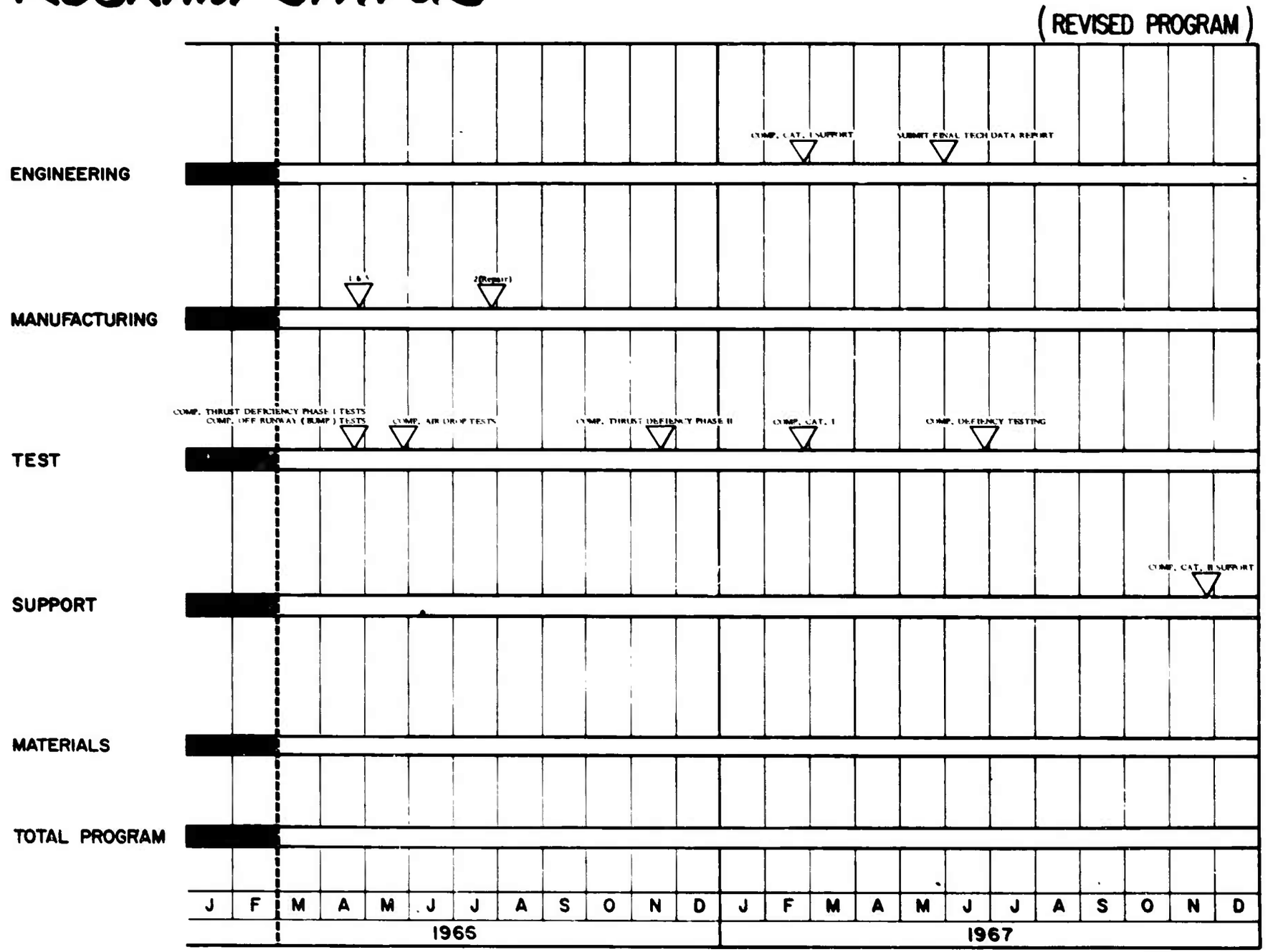
Authorization to repair the No. 2 aircraft, utilizing the wing from the No. 3 aircraft, was received in mid-February and work progressed the remainder of the month toward delivery of the aircraft by 1 August 1966. At the Contractor's facility, the No. 5 aircraft underwent instrumentation installation and preflight operations through the month with first flight on this aircraft anticipated by mid-March.

Significant progress on the Category II flight test program continued to be made at Edwards Air Force Base during the reporting period. A total of 141 flights and 20.5 flight hours were achieved. These flights included taxi runs and STOL operations with water on the runway, the first verticircuit at night, STOL passes and hover over water, off-runway tests ~~at Pt. Mugu,~~ vertical landings on a rubberized membrane and STOL and hover work over forward area landing mats at Twenty-Nine Palms, California. During the month, the aircraft required periodic inspections. Prior to this layup, the No. 4 aircraft flew on 10 consecutive work days for a total of 13 flight hours.

At the end of February, the Category I flight total remained at 191 flights and 136 hours and 25 minutes of flight time while the Category II flights numbered 46 for 54 hours and 24 minutes of flight time. Total time on the four aircraft amounted to 237 flights for 190 hours and 49 minutes.

V/S²TOL - XC-142A LTV AEROSPACE CORP.

PROGRAM STATUS



ITEM 1A DEVELOPMENT OF XC-142A AND FABRICATION OF FIVE PROTOTYPE MODELS

Repair work was initiated on No. 2 aircraft in mid-February upon receipt of authorization from ASD. Plans were made to utilize the wing from the No. 3 aircraft at Edwards AFB as the most economical means of returning the aircraft to flight status. At the end of the reporting period, it was anticipated that this aircraft would be delivered to EAFB by 1 August.

ITEM 1B FABRICATION OF STATIC TEST ARTICLE (Completed)

ITEM 2 FABRICATION OF MOCKUP (Completed)

ITEM 3 GROUND TEST PROGRAM

3.1 STRUCTURAL TESTS (Completed)

3.2 TRANSMISSION SYSTEM TESTS (Completed)

3.3 YSTEM TESTS - To date 87 of the total 93 surveillance systems and components have been certified as qualified. Tests of two additional items, namely, the electro mechanical UHT trim actuator and engine inlet duct anti-icing were completed in February bringing the total number of items for which tests are completed to 91. Test reports for the UHT trim actuator and duct anti-icing system, as well as the long stroke flap actuator, were being prepared for submission to ASD. Qualification tests of the wing incidence actuator and heat and vent system continued during the reporting period.

ITEM 4 ENGINEERING DATA

4.1 ACCOMPLISHMENTS

During February, the Engineering effort continued to be devoted to support of the flight test program, as well as preparation of airplanes Nos. 1 and 5 for delivery. Work continued to be centered around design changes to correct discrepancies uncovered during flight testing. Data concerning changes were forwarded to ASD for review and disposition and to WRAMA for assignment of

TCTO numbers. Efforts were also focused on the engineering tasks required by Contract Change Notices 33 through 38 (See pages 28 and 29). Weight of the aircraft at the close of the reporting period was 2626 pounds over guarantee.

4.2 PROBLEM AREAS

Static Thrust Program - The Contractor continued to devote emphasis to correcting the propeller static thrust deficiency. Whirl tests of the new propeller blades (2FF) were successfully completed on 25 February and the first complete aircraft set of 2FF blades was installed on the No. 1 aircraft in preparation for flight testing. Hamilton Standard completed fabrication of 2FF fatigue test blades for fatigue tests which are to be conducted during March. This will complete the propeller blade ground test program.

Recently-completed analysis of propeller characteristics at various advance ratios has indicated differential and collective control sensitivity differences which might be unsatisfactory for flight. In essence, the change in thrust per degree of change in blade angle is greater, therefore, controls will be more sensitive. The Contractor has determined control system changes necessary to insure compatibility of the control system and 2FF propellers and is releasing these changes for flight test incorporation on an "as required" basis. The cha ges consist of a new roll cam in the roll-yaw integrator, a redesigned bellcrank in the collective linkage, and three new control rods. Flight operations will start with the original or unmodified control system.

4.2.2 Reduced Cruise Performance - As reported previously, a substantial improvement in cruise performance can be obtained by the addition of propeller spinners and removal of auxiliary oil coolers from the right-hand nacelles. No action will be taken relative to these changes unless directed by ASD.

4.2.3 Directional Disturbance in Ground Effect - Work concerning directional recirculation consisted of analyzing data obtained from wind tunnel and flight tests conducted during the past few months.

ITEM 5 DESIGN DATA

5.1 STATUS OF DESIGN DATA

Status of design data at the close of the reporting period was as follows:

	Design Data	Surveillance	Total
Total Submissions to Date	215	246	461
Total Submissions to Go	4	6	10
Grand Total	219	252	471
Percent Complete	95%	95%	95%

5.2 SCN STATUS

As of 28 February, a total of 248 specification change notices against contract reports had been submitted. Of these 224 were approved, 19 were disapproved, and 5 were pending.

ITEM 6 FLIGHT TEST

During February there were no Category I flights conducted by the Contractor. No. 1 aircraft remained in layup status for the mandatory 50-flight hour transmission system inspection, for installation of Category II instrumentation and for preparation for delivery in May, 1966. The No. 5 airplane continued in preflight operations preparatory to first flight which is scheduled in March and for delivery which is scheduled in April. At the end of February, the Category I flight total remained at 191 flights for 136 hours and 25 minutes of flight time.

ITEM 7 REPORTS

The Technical Progress Report for the month of January 1966 and the semi-annual Technical Progress Report for the period July-December 1965 were in preparation for submittal to ASD in early March. The Financial Report for the month of January, 1966 was submitted on 24 February.

ITEM 8 SPARE PARTS FOR FIVE PROTOTYPE AIRPLANES

Spare parts status at the end of the reporting period was as follows:

1028 Total line items scheduled for shipment to bonded warehouse

207 Total line items scheduled for direct shipment to vendor for overhaul

1235 Total line items on order to date

ITEM 9 DEVELOPMENT AND FABRICATION OF AGE

The status of AGE development and fabrication at the end of February was as follows:

Through February	Submitted	Approved	Demonstrated
CFE-AGERD	171	120	112
GFE-AGERD	64	59	32
	235	179	144

ITEM 10 SPARE PARTS FOR AGE - NO activity in February

ITEM 11 TRAINING AND TRAINING EQUIPMENT (Complete)

ITEM 12 CONTRACTOR SUPPORT OF FLIGHT TEST PROGRAM

Support to the Category II flight test program at Edwards Air Force Base was continued throughout February by the Contractor with approximately 15 people assigned to the off-site office.

No. 3 aircraft remained in dormant status during the reporting period subsequent to the flight incident discussed in the report for last month; however, the wing was removed from the aircraft in preparation for shipment to the Contractor's facility to be used in repair of the No. 2 aircraft. Total flights on the aircraft since first flight remained at 64 and 47 hours and 18 minutes of flight time.

The No. 4 aircraft, which returned to flight status on 27 January, set a record during February of flights on 10 consecutive work days for a total of 13 flight hours as follows:

EAFB Flt. No.	Date	Time	Crew
16	1-27	0:12	Rich/Larsen
17	1-28	1:00	Rich/Larsen
18	1-31	0:06	Rich/Larsen
19	2-1	0:42	Rich/Cranney
20	2-2	1:30	Rich/Barrett
21	2-3	2:12	Rich/Odneal
22	2-4	1:30	Jones/Larsen
23	2-7	0:42	Jones/Odneal
24	2-8	2:36	Rich/Barrett
25	2-9	2:30	Jones/Boyle

Four additional flights were accomplished on the No. 4 aircraft subsequent to a six day layup period for mandatory periodic inspections.

26	2-16	1:18	Rich/Larsen
27	2-17	1:24	*
28	2-18	1:24	Rich/Chubboy
29	2-21	1:12	Jones/Barrett

*Four sets of pilots without stopping engines; Jones/Larsen, Jones/Odneal, Rich/Larsen, Jones/Barrett

During the flights in February, work accomplished consisted of pilot familarization, taxi runs and STOL operations with water on runway, radiation pattern tests, a night verticircuit for the first time, STOL passes and hover over water, off-runway tests at Point Mugu, California, vertical landings on a

rubberized membrane and STOL and hover work over forward area landing mats at Twenty-Nine Palms, California. During these flights, five additional pilots flew the aircraft making a total at the end of the month of 23 pilots who had flown the XC-142A. Total flight activity on the No. 4 aircraft at the end of February since first flight was 41 flights for 49 hours and 26 minutes.

VISITS TO CONTRACTOR FACILITY DURING FEBRUARY

Date	From	Purpose
3	El Centro and EAFB, Calf.	Discuss Air Drop Program
15	ASD BuWeps Rep	Program Briefing
14-18	SPO, ASD	Review Program Status
17	NADC, Johnsville, Pa.	Discuss Vulnerability Study
19	BuWeps, Washington, D. C.	Program Briefing
15	Air lift & Training Division	Program Briefing
15	BuWeps Rep at WPAFB	Program Briefing
23	Test Pilot School, Patuxent River, Md.	Program Briefing
24	SPO, ASD	Program Review

ECP INDEX

ECP No.	Title	Status
1	Fuselage, Installation of Aft Fuselage Escape Doors	Disapproved
2	Electrical, Installation of 35 KVA Generators	Disapproved
3	Electronics, Additional AT-256A/ARC UHF Communications Antenna; Installation of	Disapproved
4	Flight Tests, Category I Inflight Load Survey; Elimination of	Authorized
5	Ground Tests, Escape System Sled Tests; Elimination of	Authorized
6	Fuel System, Ferry Fuel Tank; Elimination of	Authorized
7	Escape System, Douglas Escapac 1-C Ejection Seat in Lieu of LW-1 (Modified) Seat; Installation of	Cancelled
8	Furnishings; Cargo, Troop Accessories for Four Airplanes, Elimination of	Authorized
9	Ground Test, Wing Fatigue Test; Elimination of	Authorized
10	Structural Demonstrator Instrumentation, Addition of	Authorized
11	Ground Test, Structural Failing Load Test, Elimination of	Authorized
12	Navigation Equipment, AN/ARC-21C in Lieu of AN/ARN-52 (V); Provisions for	Disapproved
13	Propulsion System, Integral Gearbox Propeller System Test; Reduction of	*
14	Drawing Quality Requirements; Reduction of	*
15	Weight Control Policy; Revision of	Disapproved
16	Main Propeller IGC Bearing Change	Authorized

ECP No.	Title	Status
17	Aluminum Forging Treatment to Improve Corrosion Resistance	Cancelled
18	Redesign Main Propeller Blade; Full Scale Test at NASA-Ames	Authorized
18-1	Redesign Main Propeller Blade; 0.60 Scale Test at NASA-Ames	Authorized
19	Elimination of Engine Nacelle Anti-Icing	Cancelled
20	Deletion of Category I Flight Tests on No. 4 Aircraft	Authorized
21	Cargo Compartment Trim; Elimination of	Disapproved
22	Revision to Engine Throttle Control Mechanism	Authorized
23	Extension of Category I Flight Test Program	Disapproved
24	Retrofit of Power Takeoff Engine Units	Authorized

* No longer identified as ECP.

CCN INDEX

CCN No.	Title	Date
1	Substitute 35 KVA Generator for 25 KVA Generator	12-19-62
2	Reduction in Data Requirements and Engine Designation Change	4-26-63
3	Substitute 25 KVA Generator for 35 KVA Generator	2-04-63
4	Reduction in IGB Propeller Testing	5-03-63
5	Approval of ECPs 4-9	6-05-63
6	Elimination of Structural Failing Load Tests	7-23-63
7	Approval of ECPs 5, 6, 8, 9, 16	7-23-63
8	Additional Electronic Support Equipment	7-19-63
9	Cancellation of CCNs 5 and 7 and Approval of ECPs 5, 6, 8, 9, 16	8-02-63
10	Partial Cancellation of CCN No. 2 and Reinstatement of Reduction in Data Requirements	8-22-63
11	Partial Cancellation of CCN No. 2 and Reinstatement of Engine Designation Change	8-22-63
12	Approval of ECP 18-1	9-30-63
13	Approval of ECPs 4 and 10	11-13-63
14	Approval of ECP 18	11-19-63
15	Approval of Revision to Contract Data Requirements Document	12-05-63
16	Approval of ECP 20	2-19-64
17	Approval of Inspection of Damaged Engine	3-16-64

CCN INDEX

CCN No.	Title	Date
18	Incorporation of Revision A to Detail Spec into Item 1 of Basic Contract	6-04-64
19	Approval of ECP-24	6-15-64
20	Dynamic Analysis of VTOL Thrust Stand	11-9 -64
21	Maintenance of Flight Control Simulator	12-4 -64
22	Revision of Maintenance Manual for Addition of Repair Data	2-15-65
23	Flight and Maintenance Manuals Revision	4- 5-65
24	In-Flight Load Measurement Program	5-10-65
25	Cool Suit Provisions	5-28-65
26	Category II Instrumentation Modification on Aircraft Numbers 1 and 3	6- 7-65
27	Study for Reduction of STOL Landing Distance	6-15-65
28	Improved Braking System	6-15-65
29	Category II Instrumentation Modification on Aircraft Numbers 1 and 3	6-22-65
30	Conditional Acceptance of No. 4 Aircraft	7- 7-65
31	Removal of Parts from Flight Control Simulator	7-26-65
32	Conditional Acceptance of No. 3 Aircraft	7-27-65
33	Addition of Hydraulic Quantity Indicators	1-31-66
34	Unprepared Surface Operations	1-31-66
35	Installation of Improved Brake System	1-31-66

CCN No.	Title	Date
36	Technical Manual Change	1-31-66
37	Cargo Loading and Aerial Delivery	1-31-66
38	Open Cargo Doors in Flight	1-31-66
39	Repair of No. 2 Aircraft	2- 9-66

LIST OF ABBREVIATIONS

A/C	Aircraft
AGE	Aerospace Ground Equipment
AGERD	Aerospace Ground Equipment Requirements
AMC	Army Materiel Command
APU	Auxiliary Power Unit
ASD	Aeronautical Systems Division
ATC	Air Training Command
CCN	Contract Change Notice
CFE	Contractor Furnished Equipment
CSD	Constant Speed Drive
DIET	Design Information Element Test
EAFB	Edwards Air Force Base
ECP	Engineering Change Proposal
GFE	Government Furnished Equipment
IGC	Integral Gear Case
PERT	Program Evaluation and Review Technique
PITS	Propulsion Integrated Test Stand
QEC	Quick Engine Change
SPO	Systems Program Office
TBO	Time Between Overhauls
UHT	Unit Horizontal Tail
WRAMA	Warner Robbins Air Materiel Area
TCTO	Time Compliance Technical Order